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Mechanical thrombectomy for ischemic stroke

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Published in:
Kardiologia Polska

DOI:
[10.33963/KP.15567](https://doi.org/10.33963/KP.15567)

Publication date:
2020

Licence:
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Document Version
Publisher's PDF, also known as Version of record

[Link to publication in Discovery Research Portal](#)

Citation for published version (APA):
Sievert, K., Bertog, S., Hornung, M., Grunwald, I. Q., Podlasek, A., & Sievert, H. (2020). Mechanical thrombectomy for ischemic stroke: "time is brain" is a no-brainer. *Kardiologia Polska*, 78(7-8), 801-802. <https://doi.org/10.33963/KP.15567>

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CONFLICT OF INTEREST None declared.

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HOW TO CITE Mathias K. Mechanical thrombectomy for ischemic stroke: multispecialty team training in stroke mechanical thrombectomy to optimize thrombectomy deliverability. *Kardiol Pol.* 2020; 78: 799-801. doi:10.33963/KP.15566

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"Time is brain" is a no-brainer

To the editor Stroke is among the most dreaded events. Some might consider major mental and physical disability ensuing from a stroke as worse than death. The consequences are detrimental not only for the patient but also for the families, healthcare system, and society.

For decades, medical therapy had been the treatment of choice. For ischemic stroke, intravenous fibrinolysis is recommended if the patient arrives within a time window of a 4.5 hours in absence of contraindications to the lytic therapy. Unfortunately, in large vessel occlusions that are responsible for the most devastating forms of ischemic stroke, the efficacy of lytic therapy is very limited.

It is precisely this situation in which several randomized trials have demonstrated that mechanical thrombectomy in addition to systemic fibrinolytic therapy is superior to fibrinolytic therapy alone. There is no other interventional cardiovascular therapy today that has been so convincingly demonstrated to improve functional outcome in such a dramatic fashion.

Rapid initiation of endovascular treatment is paramount to success. The time between the onset of symptoms and vessel recanalization is the most important predictor of a good clinical outcome. Unfortunately, in most regions of the world, the number of neuro-interventional centers and/or neuro-interventional specialists is insufficient to provide transcatheter

embolectomy in a timely manner while patient transfer to a tertiary comprehensive stroke center is often associated with time delays that make the difference between a favorable functional recovery and severe disability.

The clinical vignette presented in this journal by Musialek et al¹ clearly illustrates the problem that, from the statistics provided, is relevant to the fate of many hundreds of stroke patients in the country. A 69-year-old man with a major stroke arrived on a Sunday night in a large regional hospital within a time window that would make him suitable for transcatheter embolectomy. The cardiologist on call had been trained and certified in acute stroke interventions by the World Federation for Interventional Stroke Treatment (WIST) but could not perform the intervention. The patient was not accepted by the nearest comprehensive stroke center due to anticipated effect of the transport delay (1.5–2 hours) on thrombectomy eligibility (the expected patient arrival to the comprehensive stroke center was some 5–6 hours from the stroke onset). This occurred despite the fact that the rich collateral circulation suggested that the patient could benefit from embolectomy even beyond the usual 6-hour window, with a statistical cerebral and clinical benefit fundamentally smaller than that in case of an on-site immediate treatment but still fundamentally larger than in case of no intervention at all.

There are dire consequences due to our medical systems lacking the foresight and flexibility to recognize the potential of effective and safe mechanical thrombectomy by endovascular operators of various specialties including interventional cardiologists. In far too many cases this results in a dependency on life-long nursing care or death. This is not inevitable. Rather, it is completely avoidable and, therefore, unacceptable.

Interventional cardiologists can provide not only fully operational infrastructure that offers 24/7/365 interventional therapy for patients with acute myocardial infarction but also the mindset for an immediate intervention during the weekend and in the middle of the night and skills in carotid and other interventions beyond the coronary tree. Indeed, numerous recent publications from several countries on 4 continents (only some of which can be referenced below) clearly demonstrate that cardiologists are able to perform intracranial thrombectomy with results similar to those in pivotal randomized trials.²⁻⁵

The merit of mechanical thrombectomy is undisputed. It is now time to enforce health care systems modifications that will enable every eligible person to benefit from this treatment regardless of location. Analogous to primary percutaneous intervention in acute myocardial infarction, mechanical thrombectomy must occur regionally, including cardiology cathlab-based

thrombectomy-capable centers collaborating with local stroke units,²⁻⁵ without delay rather than being limited to sparse large (comprehensive) stroke centers run mostly by neuro-radiology. To achieve this, it is less important to focus on the specialty of the endovascular operator, but on how to provide the necessary training in a reasonable and timely manner. We congratulate our Polish colleagues on clearly defining, through a multi-specialty consensus under the auspices of their Ministry of Health, stroke thrombectomy unified training requirements that are similar irrespective of the operator “basic” specialty—angiology, neurology, endovascular surgery, or cardiology.¹ This is a model achievement on the map of turf wars that are regrettably continued in some places in the world at the price of human brains and lives. “Time is brain” not only means that we must open the culprit vessel as quickly as possible but, equally importantly, that a routine access to this therapy must be created quickly and safely.

ARTICLE INFORMATION

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CONFLICT OF INTEREST None declared.

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HOW TO CITE Sievert K, Bertog S, Hornung M, et al. Mechanical thrombectomy for ischemic stroke: “time is brain” is a no-brainer. *Kardiol Pol.* 2020; 130: 801-802. doi:10.33963/KP.15567

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Why is it still a gleam in people's eyes in Poland?

To the editor Mechanical thrombectomy has become the standard of care for acute ischemic stroke with proximal large vessel occlusions. Despite this accepted knowledge, in the April issue

of *Kardiologia Polska (Kardiol Pol, Polish Heart Journal)* Musiałek et al¹ presented a clinical vignette of a 69-year-old man with acute ischemic stroke and with contraindication to thrombolysis who, however, was not treated with mechanical thrombectomy in a timely fashion. The reason for this was the refusal from a single available regional stroke center due to anticipated excessively long transportation time from a local hospital where the patient was diagnosed with the use of computed tomography. Then, the patient was treated conservatively in a local hospital, and 2 months after the acute episode, he was still severely disabled and unable to live without external care. We all should agree that this exemplifies a distressful failure of the stroke-care system in Poland.

There are 2 most important questions arising from that article: 1) how many regional stroke centers do we need in Poland to diagnose and treat patients with ischemic stroke? and 2) who can perform manual thrombectomy? To address the first one, we should base the answer on the interventional cardiology experience we had so far—a network of the catheterization laboratories working 24 hours a day, 7 days a week to treat patients with acute myocardial infarction (AMI). The optimal number of individuals served by one interventional cardiology unit to offer appropriate service for patients with AMI is not precisely determined in guidelines, but in Poland it is 200 000 to 250 000. The time from onset of AMI symptoms to primary percutaneous coronary intervention should not exceed 120 minutes. A longer delay is not acceptable and these patients should be treated by thrombolysis and then transferred to a catheterization laboratory for coronary angiography. In Poland, because of a very dense public and nonpublic catheterization laboratory network (over 150 units), thrombolysis for treatment of AMI practically does not exist. Do we need the same number of thrombectomy units for the treatment of ischemic stroke? Even if probably much less would be the optimal number, we have to remember that the acceptable time window for treatment of ischemic stroke should not optimally exceed 6 hours (with extension to 24 hours in selected cases; however, the concept of “time is brain” remains critical). The patient described was within the window for mechanical thrombectomy if treated on-site and on the verge of the 6-hour window if transported to the nearest comprehensive stroke centre, though with the magnitude of collateral circulation he was likely to belong to the extended window cohort.^{2,3} And not in every case of stroke, as well as in every case of AMI, thrombolysis is desirable. Taking into consideration the very unfortunate clinical course of the example described by Musiałek et al,¹ I can conclude that the number of mechanical